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*College of Engineering*

**2002 SAFETY BELT USAGE SURVEY  
IN KENTUCKY**





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### **KENTUCKY TRANSPORTATION CENTER**

176 Raymond Building  
University of Kentucky  
Lexington, Kentucky 40506-0281

(859) 257-4513  
(859) 257-1815 (FAX)  
1-800-432-0719  
[www.ktc.uky.edu](http://www.ktc.uky.edu)  
[ktc@engr.uky.edu](mailto:ktc@engr.uky.edu)

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**Research Report  
KTC-02-20/KSP1-02-1F**

**2002 SAFETY BELT USAGE SURVEY  
IN KENTUCKY**

by

Kenneth R. Agent  
Transportation Research Engineer

and

Eric R. Green  
Transportation Research Engineer

Kentucky Transportation Center  
College of Engineering  
University of Kentucky  
Lexington, Kentucky

in cooperation with  
Kentucky State Police  
Commonwealth of Kentucky

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## **EXECUTIVE SUMMARY**

The objective of this study was to establish 2002 safety belt and child safety seat usage rates in Kentucky. The 2002 survey continues to document the results after enactment of a statewide mandatory safety belt law in 1994. Data were collected at 200 randomly selected sites spread across Kentucky. Data from the individual sites were combined into a statewide percentage considering function classification, geographic region, and vehicle miles traveled.

The data show that the usage rate in 2002 (62.0) was almost identical to that for 2001 (61.9). This compared to 60 percent in 2000, 59 percent in 1999, 54 percent in 1998, 1997 and 1995, 55 percent in 1996, and 58 percent in 1994. The current usage is substantially above the 1993 level, prior to enactment of the statewide law, of 42 percent.

The 2002 statewide usage rate for children under the age of four was determined to be 93 percent. This continues the high rate found for this age category and compares to the previous high of 89 percent in 2001.

The statewide law, except for children, involves secondary enforcement. The higher rate for children could partially be related to primary enforcement. To obtain the maximum possible increase in usage, the current law should be modified to allow primary, rather than secondary, enforcement for all vehicle occupants. The potential increase which can result from an emphasis on enforcement was shown by the results of the during the enforcement period of last year's Click It or Ticket campaign. As a minimum, primary enforcement should apply to drivers while they are in the permit and intermediate phase of the graduated license program.

## **1.0 INTRODUCTION**

The use of safety belts and child safety seats has been shown to be an effective means to reduce the injuries of motor-vehicle occupants involved in a traffic crash. There have been various methods used in the attempt to increase safety belt and safety seat usage. Past efforts have included public information campaigns, both local and statewide legislation, and enforcement of the legislation. An example was the Click It or Ticket campaign conducted around Memorial Day in 2001. The most recent legislation in Kentucky in this area was statewide legislation requiring the use of safety belts for all vehicle occupants. This law, which involves secondary enforcement, was passed in 1994 with an effective date of July 1994. Recent attempts to change the legislation to allow primary enforcement have not been successful.

The first legislation in this area was a law enacted by the 1982 Kentucky General Assembly, requiring use of a "child restraint system" for children 40 inches or less in height. The 1988 Kentucky General Assembly strengthened the child restraint law by adding a fine. Also, prior to the statewide law, local safety belt usage laws were enacted in several jurisdictions in Kentucky. The first such local law, with an effective date of July 1990, was enacted by the Lexington-Fayette Urban County Government. Prior to the statewide law, the combined population of the counties and cities having a local ordinance represented approximately one-third of the statewide population. The statewide law replaced the various local ordinances.

Statewide observational surveys were first conducted in Kentucky in 1982 and have been conducted annually to document safety belt and safety seat usage in Kentucky. The safety belt usage rate for drivers increased each survey year from only 4 percent in 1982 to 58 percent in 1994 after enactment of the statewide law. The first decrease was in 1995 when usage decreased to 54 percent with the rate remaining fairly constant at 54 to 55 percent for 1996 through 1998. The rate then increased to 59 percent in 1999, 60 percent in 2000, and 62 percent in 2001. A rate as high as 70 percent was found during the enforcement period of the Click It or Ticket campaign in 2001.

Statewide usage of child safety seats or safety belts for children under 4 years of age increased from about 15 percent in 1982, before enactment of the mandatory child restraint law, to 30 percent for 1984 through 1986. After a financial penalty was added to the law, this percentage increased to almost 50 percent in 1988. There has been a continued increase in usage with rates such as 72 percent in 1994, 82 percent in 1997, and 89 percent in 2001.

The objective of the survey summarized in this report was to establish statewide safety belt and child safety seat usage rates in Kentucky for 2002. These rates can be compared to those determined from previous surveys.

The 2002 statewide survey also determined how much of an increase could be associated with education and enforcement activities occurring around the Memorial Day. A statewide survey conducted in early 2002 found a statewide rate of 60 percent. Data collected for the statewide survey summarized in this report were taken in the weeks immediately after completion of these activities.

## **2.0 PROCEDURE**

### **2.1 DATA COLLECTION PROCEDURE**

The original data collection procedure used in the surveys, which started in 1982, was first modified in the 1990 survey. The site selection procedure used for the first several surveys was changed to obtain a more representative statewide sample, as well as to use a procedure that would be comparable to surveys taken in other states. The data collection form was changed along with the site selection procedure. The procedure and data collection form remained the same for the 1990 through 1998 surveys. A modification in the 1999 survey was that the age and sex of the driver and front seat occupants were not classified. The type of vehicle was coded instead of the age and sex information.

The data collection form first used in the 1999 survey is shown in Figure 1. Safety belt usage was recorded for drivers as well as front-seat passengers sitting in the outboard position. These occupant positions are equipped with the combination lap belt/shoulder harness type of safety belt which enables observations to be performed more easily than positions equipped only with a lap belt. The exception was for children under four years of age with data collected for both the front and rear seats.

The type of vehicle was coded for drivers and front seat passengers. Four categories of vehicles were used. These were: passenger car (PC), pickup (PU), van, and sports utility vehicle (SUV).

For drivers and front-seat passengers (over three years of age), usage was classified as either using a harness or belt or not using a restraint. For children one to three years of age, the categories included safety seat, booster seat, harness or belt, or no restraint. For children under one year of age, the categories were either safety seat or no restraint.

Two additional types of information were obtained. Starting with the 1993 survey, the use of motorcycle helmets was noted. The 1997 survey was the first in which the use of bicycle helmets was noted.

Each data collector went through a training period prior to beginning data collection. As part of the training, the data collectors reviewed the guidelines and previous reports and collected trial sets of field data. The observers then collected data simultaneously at a sample of different types of locations. The data were then reviewed by the project manager before formal data collection was started.

The quality control of the data was the responsibility of the project manager. This included a review of each of the completed data collection forms as the survey progressed to check for any problem areas or questionable data.

The following list of guidelines for data collection was given to each observer.

1. Include the driver so the number of vehicles included in the sample will be known.
2. Data are typically collected at intersections with each observer collecting data on only one approach at the intersection.
3. Include all vehicles on the approach at low-volume locations. When taking data on a multi-lane road, generally include only vehicles in the curb or near lane unless the traffic volume and roadway geometrics allow data to be collected in the next lane.
4. If traffic volume is too high to obtain data for all vehicles, record data for the next vehicle in view after recording the previous data.
5. Obtain a random sample of vehicles independent of whether the occupants are wearing a safety belt. Do not attempt to include all vehicles having an occupant wearing a safety belt at a location where all vehicles cannot be obtained.
6. Attempt to include data for children under four years of age for any vehicle in the sample in which such a child is a passenger.
7. Only include vehicles either stopped or moving slowly or from an observation point such that the occupants can be readily observed.

8. Excluding children under four years of age, collect data only for drivers and for passengers in the right-front seat (exclude the center front and rear seating positions).
9. Do not include old vehicles not equipped with a safety belt (typically those vehicles without a head rest).
10. Collect data during daylight hours on weekdays and weekends.
11. Collect two “observer hours” of data at each site. This could be two hours for one approach or one hour for two approaches if the route has two approaches at the intersection.
12. Begin and end data collection at a specified time not considering whether the occupants of the first vehicle are using a safety belt.
13. Collect data for specified types of passenger motor vehicles (cars, pickup trucks, vans, and sport utility vehicles). Data are not collected for combination trucks.
14. Collect data for both in-state and out-of-state vehicles.
15. If a problem such as weather or road construction prevents data from being collected on the assigned day and time for a specific location, a new day and time will be randomly selected by the project manager for data collection.
16. The time period in which data are collected at specific sites are randomly assigned to the data collectors by the project manager. Data are typically collected during weekdays with occasional data collected on a weekend.

Data collection was started the first week in June of 2002, after the end of the education and enforcement activities associated with the Memorial Day holiday and continued through the middle of July. As noted, data were collected for two hours at each location. This consisted of either two hours for one observer or one hour using two observers on different approaches for the specified route. The decision was made to collect data for an equal time period for each location rather than attempt to collect a given sample size.

## **2.2 DATA COLLECTION LOCATIONS**

Data for the surveys collected from 1982 through 1989 were conducted at 23 sites in 19 cities. The cities were selected so that they were distributed across the state. These cities were also selected to represent a range of population categories to account for social and economic factors. In order to be able to relate the survey results to data taken in other states and to include all types of roadways, it was necessary to expand the number of sites to include data in rural locations and for interstates. An initial change was made in 1990 and resulted in 100 sites. The distribution of the sites was based on vehicle miles traveled statewide for various categories of roads in counties with varying populations. The variables considered in the 1990 stratification process were the rural or urban designation of the road, the functional classification of the road, vehicle miles traveled, and the county population. However, a new sampling design plan was implemented in 1999 as part of a nationwide effort by the National Highway Traffic Safety Administration (NHTSA) to use a common methodology to select observational sites.

As part of the sampling design plan started in 1999, the decision was made to collect data at 200 sites. It was also decided that data would typically be obtained at intersections. For interstates and parkways, data were generally taken at the intersection of a ramp with a cross road. The basis for the decision to collect data at intersections was that it would increase accuracy since data would be collected for vehicles either stopped or moving slowly. A computer file was used to select the locations. The file is the Highway Performance Monitoring System (HPMS). Characteristics of road segments for all state maintained roads are contained in this file. In order to assure that the sampling design used an acceptable methodology, the various decisions made in the process were made along with NHTSA with the roadway segments containing the data collection sites selected by NHTSA.

Kentucky has 120 counties ranging in population from slightly over 2,000 to almost 700,000. The NHTSA guidelines allow exclusion from the survey coverage of the least populated units (counties in Kentucky) which represent 15 percent of the state's population. This exclusion reduced the number of counties in the sample from 120 to 65. All the road segments contained in the HPMS file in the counties representing 85 percent of the population were eligible for inclusion in the survey.

Road segments were stratified into three geographical regions based on highway district. There are 12 highway districts in the state. Roadways in each of the three regions were divided into seven roadway functional classification groups. This resulted in 21 stratum from which the sample was selected. The geographical regions were:

- Region 1: Highway Districts 1 through 4 (represents the western portion of the state),
- Region 2: Highway Districts 5 through 7 (covers the north central area of the state which includes the major population centers of Louisville, Lexington, and northern Kentucky), and
- Region 3: Highway Districts 8 through 12 (includes the eastern and south central portion of the state)

There are 44 counties in Region 1, 31 in Region 2, and 45 in Region 3. The state's population is divided into 29 percent in Region 1, 46 percent in Region 2, and 25 percent in Region 3. For reporting purposes, Region 1 is referred to as the West, Region 2 as the North, and Region 3 as the East. The location of these regions are shown in Figure 2.

The following seven functional classification categories were used:

1. rural interstate,
2. rural principal arterial,
3. rural minor arterial/major collector,
4. rural minor collector/local,
5. urban interstate/freeway,
6. urban principal arterial, and
7. urban minor arterial/collector/local.

Selections were made from roadway segments which contained either an interchange, an intersection with a stop sign, an intersection with a traffic signal, or a combination of these. A segment could contain more than one intersection or interchange. If a segment had more than one intersection with a stop sign or signal or interchange, one intersection was randomly selected. For example, if a segment had three intersections with signals, a separate number of one, two, or three was randomly selected. The random number assigned the intersection to be selected for data collection (along the route as it was driven in its cardinal direction).

An equal probability selection (simple random sample) of the road segments was made within each of the 21 strata using the HPMS file as the source of the necessary road segment information. Following is the number of segments selected in each strata.

	<u>Region 1</u>	<u>Region 2</u>	<u>Region 3</u>	<u>All</u>
Rural Interstate	8	12	6	26
Rural Principal Arterial	12	6	12	30
Rural Minor Arterial/ Major Collector	12	10	12	34
Rural Minor Collector/Local	8	6	8	22
Urban Interstate/Freeway	6	20	2	28
Urban Principal Arterial	10	14	6	30
Urban Minor Arterial/ Collector/Local	10	14	6	30
All	66	82	52	200

For each selected road segment, information was printed from the HPMS file to be used to select a specific location for data collection. This information included the county, route, beginning and ending milepoint, the number of intersections or interchanges within the segment, and a counter showing which intersection or interchange to select if there was more than one within the segment.

A list of the 120 counties in Kentucky along with their population, the number of sites in each county, and their region in the state is given in Appendix A. A road segment was selected in 58 counties. The largest number of segments was 20 in Jefferson County. A list of the intersections or interchanges where data was collected within each of these segments is given in Table 1. For each site, the county, route, and intersecting route (or exit number for an interstate or parkway) is given. The nearest town to the data collection site is also listed along with the geographical region and functional classification. Data were typically collected at the intersection of the ramps and intersecting road at interchanges. The exception was at rural interchanges where there were very few exiting vehicles where data were collected on the mainline.

The observation sites were randomly ordered to assist in the sequence of sites at which data were collected. Some of the sites were grouped based on geographical region to aid the efficiency of the data collection process.

### **2.3 SURVEY DATA ANALYSIS**

As part of the summary of information from the HPMS file for each randomly selected roadway segment, the functional classification, region, and vehicle miles traveled were listed. The total vehicle miles for the road segments in each of the 21 stratum were also summarized to be used in the estimation process.

The survey data were input into an EXCEL spreadsheet to summarize the data and obtain the results. The results for each survey site were reviewed to determine if there were any possible problems with either the data collection or input. The computer results were checked manually if a potential problem was observed. A second set of data was collected if the data at a specific site was inconsistent with other data.

Safety belt usage rates were determined for the driver and for all front-seat occupants. Rates were also obtained by vehicle type for both the driver and all front-seat occupants. For children under four years of age, usage rates were obtained for both front- and rear-seating positions, as well as for combined seating positions. Statewide rates were obtained, using an EXCEL spreadsheet analysis, by weighting the usage determined for each location by the vehicle miles traveled in the road segment.

Various usage rates were determined for each location. The rates were for all front seat passengers, drivers, front-seat occupants, and all children under four years of age (front and rear). The rate for each of the 21 stratum (based on region and functional classification categories) were determined by weighting the usage rate for each location by the proportion of the vehicle miles traveled at that location of the vehicle miles at all observational sites in the stratum.

A statewide rate was then determined using the usage rate determined for each stratum and the total vehicle miles traveled in that stratum (statewide for the counties representing 85 percent of the population). The statewide rate was the sum of the products of the usage rate for each stratum and the proportion of the vehicle miles traveled in that stratum of the total statewide vehicle miles.

A consultant was initially used to review the procedures necessary to conduct the various statistical tests. The variance, bound on the error of estimation (which is half of the 95 percent confidence interval), and relative error were calculated for the statewide usage rate for all front seat passengers. These data were also determined for each of the 21 strata, the three regions, and the seven functional classes. The software initially used in this analysis was Statistical Analysis Software (SAS) for Windows, version 8. An EXCEL spreadsheet analysis is currently used to obtain the necessary statistical tests. The relative error and confidence interval was also determined at each location for the usage rate found for all front seat occupants.

### **3.0 SURVEY RESULTS**

Usage rates for all front seat occupants (drivers and passengers) for the various types of highways and regions of the state are summarized in Table 2. The overall statewide rate in 2002, using the data collected at 200 sites and the described weighting procedure, was 62.0 percent. The 95 percent confidence interval was 0.3 percent. The sample size of all front seat occupants was 116,275. The usage rate by region varied from 65.4 percent in Region 2 (north) to 55.8 percent in Region 3 (east) with 60.9 percent in Region 1 (west).

The highest rate by the functional classification of the highway was 68.5 percent for urban interstate/freeway with the lowest 53.7 percent for rural minor collector/local roads. The relative error and confidence interval for the usage rates found for all front seat occupants (by region and highway functional classification) are given in Appendix B.

Usage rates for drivers for the various types of highways and regions of the state are summarized in Table 3. The overall statewide rate for drivers in 2002 was 62.4 percent. Drivers accounted for 79 percent of front seat occupants so they dominated the percentage determined for all front seat occupants. Usage rates for front seat passengers was 60.4 percent (Table 4).

Usage rates for children under four years of age are given in Table 5. These rates are for children in both the front and the rear seats. The usage rate for children under one year of age (98.7 percent) was higher than that for children one to three years of age (91.9 percent). The usage rate for the combination of these categories, or children under four years of age, was 92.9 percent.

The sample size for children under four years of age was 1,041. This age category corresponds to the children for which the mandatory child restraint law would apply. The 2002 usage rate of 92.9 percent compares to a range in the previous ten years of 57 percent in 1991 to 89 percent in 1999. This percentage was about 15 percent in 1982 before enactment of the child restraint law, increased to approximately 30 percent after enactment of the law having no penalty, and increased again to almost 50 percent in 1988 after the addition of a monetary penalty to the child restraint law.

The usage rate for children under four years of age was higher in the rear seat compared to the front seat. For children one to three years of age, the usage rate was 93 percent for the rear seat compared to 60 percent for the front seat. For children under one year old, the usage rate was 100 percent for the rear seat compared to 92 percent for the front seat. The large majority of children were sitting in the rear seat for both age groups (about 86 percent for one to three years of age

and 87 percent for under one). The overall percentage of children in the rear seat of 86 percent in 2002 compares to 85 percent in 2001, 83 percent in 2000, 79 percent in 1999, 80 percent in 1998, 75 percent in 1997, and 57 percent in 1996.

A summary of the data collected is given in Appendix C. For each of the 200 data sites, the usage rate and sample size are given for all front seat occupants, drivers, front-seat passengers, and children under four years of age (both front and rear seat). The relative error and confidence interval is given for the “all front seat occupant” category. Usage rates for front seat occupants ranged from 25 percent to 78 percent. There were four sites which had a usage rate of under 40 percent with all in the rural minor collector/local category. There were 42 sites which had a usage rate of 70 percent or above with 32 of these an interstate or parkway location. The highest rate found on a non-interstate or parkway was 77 percent on a rural principal arterial road (US 60) in Woodford County.

While the data collection procedure changed in 1990 and 1999, the usage rate may still be compared to the statewide rates from past years (Table 6). The previous studies showed that statewide driver usage rates had steadily increased from 4 percent in 1982 to 42 percent in 1993. However, the amount of the yearly increase had decreased. Only a three percentage point increase occurred in the two-year period from 1991 to 1993. The 58 percent usage in the 1994 survey showed that a dramatic increase occurred between the 1993 and 1994 data collection periods. This increase was directly related to the enactment of a statewide safety belt law. The 1995 survey showed that driver usage (54 percent) remained substantially higher than before enactment of the law, but there was a slight decrease in usage from the 1994 rate immediately after enactment of the law. This level continued through 1998 before an increase to 59 percent in 1999. The increase in usage has continued with 60 percent in 2000, 61.9 percent in 2001, and 62.0 in 2002.

A substantial difference in usage rate (for all front seat occupants) was noted when vehicle type is considered (Table 7). The rate varied substantially from 69.1 percent for sport utility vehicles down to 46.3 percent for pickup trucks. The rate for passenger cars was 67.0 percent with 68.2 percent for vans. It can be seen that use of safety belts is much lower in pickup trucks than any other vehicle type, and pickup trucks made up about 25 percent of the sample. The largest sample was for passenger cars with 52 percent followed by 12 percent for sport utility vehicles and 10 percent for vans.

Helmet use by motorcyclists was also observed. Kentucky had a statewide law requiring the use of a helmet by a motorcyclist until it was repealed starting July 15, 1998. The results of surveys taken during the mandatory usage period had found a usage rate of over 95 percent. Data were taken in 1998 both before and after the effective date of the repeal. Prior to July 15, 1998 only 10 of the 240

observed motorcyclists were not wearing a helmet, giving a usage rate of 96 percent. After this date, 29 of 148 motorcyclists were observed not wearing a helmet giving a usage rate of 76 percent. In 1999, 164 of 452 motorcyclists were observed not wearing a helmet with a weighted usage rate was 65 percent. The weighted rate for 2000 was 70 percent with a sample size of 427. The weighted rate decreased to 56 percent in 2001 with a sample size of 395. Usage was very similar in 2002 with a usage rate of 58 percent. The weighted usage rate for 2002 was 57 percent with a sample size of 596. The usage rate was the highest in the west region of the state with 58 percent followed by 54 percent in the north region and 51 percent in the east region.

Bicycle helmet use was only observed for 65 bicyclists. Only 6 of these bicyclists were wearing a helmet. This low rate (9 percent) shows the need for additional public information about this subject. This rate is lower than the 24 percent in 2000 and the 12 percent in 1999, but higher or equal to than that found in previous years (9 percent in 1998, and 8 percent in 1997).

#### **4.0 SUMMARY**

Observations were taken at 200 sites across Kentucky to obtain safety belt usage rates. The 2002 survey resulted in a sample size of 116,275 front seat occupants (including 91,304 drivers). The data collection procedure and site selection criteria were based on national criteria.

A statewide safety belt law was passed in Kentucky in 1994. The law applies to all vehicle occupants. Prior to the statewide law, there were local ordinances passed in several cities and counties which covered approximately one-third of the statewide population. The data collected in 1994, after the effective date of the statewide law, showed that enactment of the statewide law had a dramatic effect on usage rates. The usage rate for front seat occupants increased from 42 percent in 1993 to 58 percent in 1994. It then decreased slightly from 54 to 55 percent in 1995 through 1998. The usage rate of 58.6 percent in 1999 showed that the rate had increased to a level similar to that found immediately after enactment of the statewide law. There was a small increase in usage to 59.8 percent in 2000 with a larger increase rate in 2001 to 61.9 percent and 2002 to 62.0 percent. The trend in usage rates from 1982 through 2002 is given in Table 6.

The usage rate was highest in the region of the state which included the largest population centers (Louisville, Lexington, and northern Kentucky). Usage was highest on interstates and lowest on local roads. When type of vehicle was considered, usage was highest for sport utility vehicles and lowest for pickup trucks.

The statewide usage rate for children under the age of four (including both

the front and rear seat) was determined to be 92.9 percent in 2002. This compares to 89 percent in 2001, 87 percent in 2000, 89 percent in 1999 and 80 percent in 1998 and continues to show the high usage for this age group. One reason for the very high usage for small children is that primary, rather than secondary, enforcement applies.

The motorcycle helmet law was repealed in 1998. There had been a very high compliance of the requirement to wear a helmet (over 95 percent), but the helmet usage percentage has decreased to 57 percent in 2002. This shows the large decrease in usage related to the repeal of the mandatory usage law. The percentage of a small sample of bicyclists observed wearing a safety helmet was very low (9 percent).

While the statewide usage rate of approximately 62 percent represents a two percentage point increase from 2000, the rate is lower than the peak of about 70 percent found for a mini-survey taken during the enforcement phase of the Click It or Ticket campaign (which was conducted around Memorial Day in 2001).

## **5.0 RECOMMENDATIONS**

The data show that the level of safety belt usage in 2002 was almost identical to 2001 continuing the increase found in 1999. It is the highest since the start of the surveys in 1982. The increase in 2002 found between the two surveys (60 to 62 percent) can be related to efforts in the areas of both education and enforcement activities. Public information and education should continue. Also, enforcement of the law, along with public information about this enforcement and resulting citations, should continue to be increased.

However, the benefits which can be gained through education and enforcement of a secondary law are limited. The reduction in usage since the end of the enforcement phase of the Click It or Ticket campaign in 2001 supports this conclusion. The very high usage for small children can be partially attributed to primary enforcement. To obtain the maximum usage for all vehicle occupants, the current law should be modified to allow primary, rather than secondary, enforcement. As a minimum, primary enforcement should be effective for drivers in the permit and intermediate phase of the graduated license program.

The survey data can be used to identify areas in need of additional enforcement and education. Specifically, usage was lowest in the east region of the state. Also, usage was substantially lower for occupants of pickup trucks compared to other vehicle types.

Figure 1. Data Collection Form

## SAFETY BELT DATA COLLECTION FORM

Date: \_\_\_\_\_ Starting Time: \_\_\_\_\_ Ending Time: \_\_\_\_\_ Int#: \_\_\_\_\_

Location: \_\_\_\_\_ Sheet #: \_\_\_\_\_

Observer: \_\_\_\_\_ Comment: \_\_\_\_\_

### DRIVER USAGE

Vehicle	Harness or Belt	None
PC		
PU		
VAN		
SUV		

### FRONT-SEAT OCCUPANT USAGE (OVER 3 YEARS OF AGE)

Vehicle	Harness or Belt	None
PC		
PU		
VAN		
SUV		

### USAGE FOR CHILDREN (1-3 YEARS OF AGE)

Position	Safety Seat	Booster Seat	Harness or Belt	None
FRONT				
REAR				

### USAGE FOR INFANTS (UNDER 1 YEAR OF AGE)

Position	Safety Seat	None
FRONT		
REAR		

### USAGE OF MOTORCYCLE HELMET

YES	No

### USAGE OF BICYCLE HELMET

YES	No

4/1998



Table 1. SURVEY LOCATIONS

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
1	West	Rural Interstate	Simpson	I-65 at Exit 6	Franklin
2	West	Rural Interstate	Christian	I-24 at Exit 73	Newstead
3	West	Rural Interstate	Barren	I-65 at Exit 48	Cave City
4	West	Rural Interstate	Hardin	I-65 at Rest Area (Sonora)	Sonora
5	West	Rural Interstate	Barren	I-65 at Exit 53	Cave City
6	West	Rural Interstate	Hardin	I-65 at Exit 102	Lebanon Junction
7	West	Rural Interstate	Marshall	I-24 at Exit 27	Lake City
8	West	Rural Interstate	Simpson	I-65 at Exit 2	Franklin
9	West	Rural Principal Arterial	Hardin	Bluegrass Parkway at I-65	Elizabethtown
10	West	Rural Principal Arterial	Marion	US 68 at KY 208	Lebanon
11	West	Rural Principal Arterial	Meade	US 31W at KY 1638	Muldraugh
12	West	Rural Principal Arterial	Warren	US 231 at KY 622	Bowling Green
13	West	Rural Principal Arterial	Hopkins	Western Kentucky Parkway at Exit 24	Dawson Springs
14	West	Rural Principal Arterial	Hopkins	Pennyrile Parkway at Exit 33	Nortonville
15	West	Rural Principal Arterial	Grayson	Western Kentucky Parkway at Exit 107	Leitchfield
16	West	Rural Principal Arterial	Marshall	Purchase Parkway at Exit 47	Draffenville
17	West	Rural Principal Arterial	Marshall	US 641 at KY 58	Benton
18	West	Rural Principal Arterial	Marshall	US 68 at US 641	Draffenville
19	West	Rural Principal Arterial	Graves	US 45 at KY 1276	Mayfield
20	West	Rural Principal Arterial	Marshall	US 641 at US 68	Draffenville
21	West	Rural Minor Arterial/Major Collector	Barren	US 31W at KY 70	Cave City
22	West	Rural Minor Arterial/Major Collector	Marion	KY 426 at US 68/KY 55	Lebanon
23	West	Rural Minor Arterial/Major Collector	Barren	US 31W at KY 90	Cave City
24	West	Rural Minor Arterial/Major Collector	McCracken	KY 286 at US 62	Bardwell
25	West	Rural Minor Arterial/Major Collector	McCracken	KY 305 at KY 358	Paducah
26	West	Rural Minor Arterial/Major Collector	Muhlenburg	KY 189 at US 62	Greenville
27	West	Rural Minor Arterial/Major Collector	Grayson	KY 259 at US 62	Leitchfield
28	West	Rural Minor Arterial/Major Collector	Muhlenburg	US 431 at KY 189	Central City
29	West	Rural Minor Arterial/Major Collector	Grayson	KY 259 at W. Lake	Leitchfield
30	West	Rural Minor Arterial/Major Collector	Breckinridge	KY 79 at KY 259	Harned
31	West	Rural Minor Arterial/Major Collector	Grayson	KY 79 at US 62	Caneyville
32	West	Rural Minor Arterial/Major Collector	Logan	US 431 at KY 663	Adairville
33	West	Rural Minor Collector/Local	Taylor	KY 3183 at KY 55	Campbellsville
34	West	Rural Minor Collector/Local	Logan	KY 1038 at KY 103	Auburn
35	West	Rural Minor Collector/Local	Henderson	KY 1299 at KY 425	Henderson
36	West	Rural Minor Collector/Local	Taylor	KY 527 at KY 3212	Campbellsville
37	West	Rural Minor Collector/Local	Logan	US 68 at US 79	Russellville
38	West	Rural Minor Collector/Local	Muhlenburg	US 62 at KY 181	Greenville
39	West	Rural Minor Collector/Local	Barren	KY 677 at KY 740	Three Springs
40	West	Rural Minor Collector/Local	Meade	KY 144 at KY 259	Rhodelia
41	West	Urban Interstate/Freeway	Hardin	Western Kentucky Parkway at US 31W	Elizabethtown
42	West	Urban Interstate/Freeway	Hardin	I-65 at Exit 94	Elizabethtown
43	West	Urban Interstate/Freeway	Christian	Pennyrile Parkway at Exit 8	Hopkinsville
44	West	Urban Interstate/Freeway	Hopkins	Pennyrile Parkway at Exit 44	Madisonville
45	West	Urban Interstate/Freeway	Daviess	US 60B at US 431	Owensboro
46	West	Urban Interstate/Freeway	Daviess	William Natcher Parkway at Exit 70	Owensboro
47	West	Urban Principal Arterial	McCracken	US 60 at I-24	Paducah
48	West	Urban Principal Arterial	Daviess	US 431 at 2nd Street	Owensboro
49	West	Urban Principal Arterial	Nelson	US 31E at KY 1430	Bardstown
50	West	Urban Principal Arterial	Barren	US 31E at US 68	Glasgow

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
51	West	Urban Principal Arterial	McCracken	US 60/62 at Bridge Street	Paducah
52	West	Urban Principal Arterial	Warren	US 68/80 at KY 880	Bowling Green
53	West	Urban Principal Arterial	Warren	US 68/80 at Main Avenue	BowlingGreen
54	West	Urban Principal Arterial	Henderson	US 41A at 5th St.	Henderson
55	West	Urban Principal Arterial	Barren	US 31E at KY 90	Glasgow
56	West	Urban Principal Arterial	Hardin	US 31W at KY 1600	Elizabethtown
57	West	Urban Minor Arterial/Collector/Local	Hardin	KY 3005 at KY 1357	Elizabethtown
58	West	Urban Minor Arterial/Collector/Local	Barren	KY 63 at US 31EX	Glasgow
59	West	Urban Minor Arterial/Collector/Local	McCracken	KY 787 at US 62	Paducah
60	West	Urban Minor Arterial/Collector/Local	McCracken	KY 994 at Schneidman Road	Paducah
61	West	Urban Minor Arterial/Collector/Local	Logan	KY 3233 at US 79 & US 431 Truck Rte.	Russellville
62	West	Urban Minor Arterial/Collector/Local	Henderson	KY 136 at US 41	Henderson
63	West	Urban Minor Arterial/Collector/Local	Calloway	KY 1327 at 16 <sup>th</sup> Street	Murray
64	West	Urban Minor Arterial/Collector/Local	McCracken	US 45X (Broadway) at N.13th Street	Paducah
65	West	Urban Minor Arterial/Collector/Local	McCracken	US 45 at Clay Avenue (6 <sup>th</sup> Street)	Paducah
66	West	Urban Minor Arterial/Collector/Local	McCracken	KY 994 at US 60/62	Paducah
67	North	Rural Interstate	Clark	I-64 at Rest Area	Winchester
68	North	Rural Interstate	Boone	I-75 at Exit 175	Richwood
69	North	Rural Interstate	Oldham	I-71 at Exit 22	LaGrange
70	North	Rural Interstate	Montgomery	I-64 at Exit 110	Mt. Sterling
71	North	Rural Interstate	Boone	I-75 at Exit 171	Walton
72	North	Rural Interstate	Boone	I-275 at Exit 11	Covington
73	North	Rural Interstate	Shelby	I-64 at Exit 43	Waddy
74	North	Rural Interstate	Franklin	I-64 at Exit 53	Frankfort
75	North	Rural Interstate	Bullitt	I-65 at Exit 117	Shepardsville
76	North	Rural Interstate	Shelby	I-64 at Exit 28	Simpsonville
77	North	Rural Interstate	Scott	I-64 at Exit 69	Georgetown
78	North	Rural Interstate	Oldham	I-71 at Exit 14	Brownsboro
79	North	Rural Principal Arterial	Boyle	US 150 at US 127 Bypass	Danville
80	North	Rural Principal Arterial	Woodford	US 60 at US 62	Versailles
81	North	Rural Principal Arterial	Scott	US 460 at US 62	Georgetown
82	North	Rural Principal Arterial	Woodford	Bluegrass Parkway at Exit 68	Versailles
83	North	Rural Principal Arterial	Jessamine	US 27 at US 27X	Nicholasville
84	North	Rural Principal Arterial	Bullitt	US 31E at KY 44	Mt.Washington
85	North	Rural Minor Arterial/Major Collector	Mercer	KY 33 at US 68	Pleasant Hill
86	North	Rural Minor Arterial/Major Collector	Oldham	KY 22 at KY 53	Ballardsville
87	North	Rural Minor Arterial/Major Collector	Boone	KY 14 at KY 16	Verona
88	North	Rural Minor Arterial/Major Collector	Oldham	KY 146 at KY 1817	Buckner
89	North	Rural Minor Arterial/Major Collector	Clark	KY 418 at KY 3371	Winchester
90	North	Rural Minor Arterial/Major Collector	Kenton	KY 536 at KY 177	Visalia
91	North	Rural Minor Arterial/Major Collector	Shelby	KY 44 at KY 53	Shelbyville
92	North	Rural Minor Arterial/Major Collector	Grant	KY 467 at KY 22	Dry Ridge
93	North	Rural Minor Arterial/Major Collector	Scott	KY 32 at US 25	Georgetown
94	North	Rural Minor Arterial/Major Collector	Jefferson	US 60 at Beckley Station Road	Louisville
95	North	Rural Minor Collector/Local	Montgomery	KY 646 at KY 11	Camargo
96	North	Rural Minor Collector/Local	Montgomery	KY 1991 at KY 537	Mt. Sterling
97	North	Rural Minor Collector/Local	Boyle	KY 1273 at US 150	Danville
98	North	Rural Minor Collector/Local	Franklin	KY 2820 at US 127	Frankfort
99	North	Rural Minor Collector/Local	Campbell	KY 735 at KY 9	Mentor
100	North	Rural Minor Collector/Local	Jessamine	KY 3433 at KY 29	Wilmore

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
101	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 2	Louisville
102	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 16	Louisville
103	North	Urban Interstate/Freeway	Jefferson	I-64 at Exit 5B	Louisville
104	North	Urban Interstate/Freeway	Fayette	I-64 at Exit 87	Lexington
105	North	Urban Interstate/Freeway	Jefferson	I-265 at Exit 12	Louisville
106	North	Urban Interstate/Freeway	Campbell	I-275 at Exit 77	Wilders
107	North	Urban Interstate/Freeway	Fayette	I-75 at Exit 104	Lexington
108	North	Urban Interstate/Freeway	Jefferson	I-265 at Exit 27	Louisville
109	North	Urban Interstate/Freeway	Boone	I-75 at Exit 180	Erlanger
110	North	Urban Interstate/Freeway	Kenton	I-75 at Exit 186	Crescent Springs
111	North	Urban Interstate/Freeway	Jefferson	I-64 at Exit 17	Louisville
112	North	Urban Interstate/Freeway	Clark	I-64 at Exit 96	Winchester
113	North	Urban Interstate/Freeway	Fayette	I-75 at Exit 108	Lexington
114	North	Urban Interstate/Freeway	Campbell	I-471 at Exit 2	Ft. Thomas
115	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 22	Louisville
116	North	Urban Interstate/Freeway	Kenton	I-275 at Exit 83	Erlanger
117	North	Urban Interstate/Freeway	Jefferson	I-65 at Exit 127	Louisville
118	North	Urban Interstate/Freeway	Kenton	I-75 at Exit 184	Erlanger
119	North	Urban Interstate/Freeway	Boone	I-275 at Exit 7	Hebron
120	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 5	Louisville
121	North	Urban Principal Arterial	Jefferson	US 31W at KY 841	Louisville
122	North	Urban Principal Arterial	Jefferson	US 31E at First Street	Louisville
123	North	Urban Principal Arterial	Fayette	Euclid Ave. at Upper Street (US 27)	Lexington
124	North	Urban Principal Arterial	Campbell	US 27 at KY 8 (4th Street)	Newport
125	North	Urban Principal Arterial	Scott	US 460 B at US 460	Georgetown
126	North	Urban Principal Arterial	Fayette	US 68 at Ft. Harrod Drive	Lexington
127	North	Urban Principal Arterial	Jefferson	US 150 at 18th Street	Louisville
128	North	Urban Principal Arterial	Jefferson	KY 1934 at KY 2051	Louisville
129	North	Urban Principal Arterial	Jefferson	US 31E at Tyler Lane	Louisville
130	North	Urban Principal Arterial	Jefferson	US 31W at Garrs Lane	Louisville
131	North	Urban Principal Arterial	Jefferson	US 31W at Ashby Lane	Louisville
132	North	Urban Principal Arterial	Jefferson	US 150 at Clay Avenue	Louisville
133	North	Urban Principal Arterial	Kenton	KY 16 at West 34th Street	Covington
134	North	Urban Principal Arterial	Campbell	KY 1120 at US 27	Newport
135	North	Urban Minor Arterial/Collector/Local	Woodford	US 60X at US 60	Versailles
136	North	Urban Minor Arterial/Collector/Local	Jefferson	KY 1020 at I-264	Louisville
137	North	Urban Minor Arterial/Collector/Local	Boone	KY 237 at KY 18	Burlington
138	North	Urban Minor Arterial/Collector/Local	Scott	US 62 at US 460	Georgetown
139	North	Urban Minor Arterial/Collector/Local	Bullitt	US 31EX at KY 44	Mt. Washington
140	North	Urban Minor Arterial/Collector/Local	Kenton	KY 17 at KY 16	Latonia
141	North	Urban Minor Arterial/Collector/Local	Jessamine	US 27X at Orchard Drive	Nicholasville
142	North	Urban Minor Arterial/Collector/Local	Jefferson	KY 864 at Breckinridge Street	Louisville
143	North	Urban Minor Arterial/Collector/Local	Boone	KY 3076 at Minola Pike	Florence
144	North	Urban Minor Arterial/Collector/Local	Boone	US 42 at US 25	Florence
145	North	Urban Minor Arterial/Collector/Local	Scott	KY 620 at US 25	Georgetown
146	North	Urban Minor Arterial/Collector/Local	Scott	KY 2906 at US 460	Georgetown
147	North	Urban Minor Arterial/Collector/Local	Kenton	KY 3070 at KY 16	Independence
148	North	Urban Minor Arterial/Collector/Local	Clark	US 60 at KY 89	Winchester
149	East	Rural Interstate	Whitley	I-75 at Exit 25	Williamsburg
150	East	Rural Interstate	Rockcastle	I-75 at Exit 62	Mt. Vernon

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
151	East	Rural Interstate	Carter	I-64 at Exit 156	Olive Hill
152	East	Rural Interstate	Carter	I-64 at Exit 172	Grayson
153	East	Rural Interstate	Boyd	I-64 at Exit 181	Ashland
154	East	Rural Interstate	Boyd	I-64 at Exit 185	Ashland
155	East	Rural Principal Arterial	Letcher	US 119 at KY 15	Whitesburg
156	East	Rural Principal Arterial	Bell	US 25E at KY 66	Pineville
157	East	Rural Principal Arterial	Greenup	KY 8 at US 23 Truck Route	South Portsmouth
158	East	Rural Principal Arterial	Breathitt	KY 15 at KY 30	Jackson
159	East	Rural Principal Arterial	Harlan	US 421 at KY 72	Harlan
160	East	Rural Principal Arterial	Martin	KY 645 at KY 40	Inez
161	East	Rural Principal Arterial	Pike	US 460 at KY 1460	Pikeville
162	East	Rural Principal Arterial	Letcher	KY 15 at KY 15X	Whitesburg
163	East	Rural Principal Arterial	Harlan	US 119 at US 421	Harlan
164	East	Rural Principal Arterial	Knox	US 25E at KY 225/3439	Barbourville
165	East	Rural Principal Arterial	Harlan	US 119 at KY 2179	Cumberland
166	East	Rural Principal Arterial	Lincoln	US 27 at US 150	Stanford
167	East	Rural Minor Arterial/Major Collector	Greenup	KY 2 at US 23	Greenup
168	East	Rural Minor Arterial/Major Collector	Johnson	KY 172 at KY 40	Staffordsville
169	East	Rural Minor Arterial/Major Collector	Carter	KY 174 at US 60	Olive Hill
170	East	Rural Minor Arterial/Major Collector	Bell	KY 190 at US 25E	Pineville
171	East	Rural Minor Arterial/Major Collector	Letcher	KY 7 at KY 931	Isom
172	East	Rural Minor Arterial/Major Collector	Letcher	KY 317 at KY 7	Whitesburg
173	East	Rural Minor Arterial/Major Collector	Breathitt	KY 476 at KY 15	Jackson
174	East	Rural Minor Arterial/Major Collector	Carter	US 60 at KY 7	Grayson
175	East	Rural Minor Arterial/Major Collector	Lincoln	KY 618 at KY 39	Crab Orchard
176	East	Rural Minor Arterial/Major Collector	Pulaski	KY 80 at KY 837	Nancy
177	East	Rural Minor Arterial/Major Collector	Floyd	KY 1426 at KY 979	Harold
178	East	Rural Minor Arterial/Major Collector	Laurel	KY 1193 at KY 192	Baldrock
179	East	Rural Minor Collector/Local	Johnson	KY 3214 at KY 172	Paintsville
180	East	Rural Minor Collector/Local	Floyd	KY 680 at KY 122	McDowell
181	East	Rural Minor Collector/Local	Whitley	KY 1481 at 204	Williamsburg
182	East	Rural Minor Collector/Local	Johnson	KY 1107 at KY 302	Van Lear
183	East	Rural Minor Collector/Local	Whitley	KY 1595 at KY 92	Siler
184	East	Rural Minor Collector/Local	Adair	KY 531 at KY 80	Columbia
185	East	Rural Minor Collector/Local	Clay	KY 638 at US 421	Manchester
186	East	Rural Minor Collector/Local	Laurel	KY 1006 at KY 192	London
187	East	Urban Interstate/Freeway	Laurel	I-75 at Exit 38	London
188	East	Urban Interstate/Freeway	Rowan	I-64 at Exit 137	Morehead
189	East	Urban Principal Arterial	Perry	KY 15 at KY 15X	Hazard
190	East	Urban Principal Arterial	Greenup	US 23 at KY 693	Flatwoods
191	East	Urban Principal Arterial	Laurel	US 25E at I-75	Corbin
192	East	Urban Principal Arterial	Boyd	US 23 at Mall Road	Ashland
193	East	Urban Principal Arterial	Boyd	US 23 at US 60	Ashland
194	East	Urban Principal Arterial	Laurel	US 25E at US 25	Corbin
195	East	Urban Minor Arterial/Collector/Local	Perry	KY 451 at KY 15X	Hazard
196	East	Urban Minor Arterial/Collector/Local	Pike	KY 1460 at KY 1426	Pikeville
197	East	Urban Minor Arterial/Collector/Local	Laurel	US 25 at KY 80	London
198	East	Urban Minor Arterial/Collector/Local	Greenup	KY 750 at KY 207	Flatwoods
199	East	Urban Minor Arterial/Collector/Local	Whitley	US 25W at KY 296	Williamsburg
200	East	Urban Minor Arterial/Collector/Local	Pulaski	KY 80 at KY 2296	Somerset

TABLE 2. USAGE RATE FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	70.6	67.7	67.0	68.3
Rural Principal Arterial	65.9	71.8	55.1	61.8
Rural Minor Arterial/Major Collector	53.7	65.7	51.0	55.6
Rural Minor Collector/Local	51.7	57.4	54.0	53.7
Urban Interstate/Freeway	68.0	68.5	70.1	68.5
Urban Principal Arterial	60.0	60.7	59.7	60.4
Urban Minor Arterial/Collector/Local	61.7	60.9	53.4	60.2
All	60.9	65.4	55.8	62.0

TABLE 3. USAGE RATE FOR DRIVERS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	70.8	67.6	67.4	68.3
Rural Principal Arterial	66.5	72.0	55.3	62.1
Rural Minor Arterial/Major Collector	55.2	66.5	51.1	56.4
Rural Minor Collector/Local	51.6	58.9	54.9	54.3
Urban Interstate/Freeway	67.6	68.7	71.8	68.6
Urban Principal Arterial	61.3	60.6	61.1	60.8
Urban Minor Arterial/Collector/Local	61.4	61.5	54.8	60.7
All	61.5	65.7	56.2	62.4

TABLE 4. USAGE RATE FOR ALL FRONT SEAT PASSENGERS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	69.9	67.8	66.1	68.0
Rural Principal Arterial	63.4	71.2	54.8	60.5
Rural Minor Arterial/Major Collector	49.0	62.0	50.4	52.6
Rural Minor Collector/Local	52.3	53.3	51.3	52.0
Urban Interstate/Freeway	69.2	67.5	62.6	67.5
Urban Principal Arterial	54.9	60.7	54.8	58.5
Urban Minor Arterial/Collector/Local	62.5	57.0	49.1	57.6
All	58.7	64.0	54.1	60.4

TABLE 5. USAGE RATE FOR CHILDREN UNDER FOUR YEARS OF AGE (FRONT AND REAR)

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	76.7	100.0	99.0	94.2
Rural Principal Arterial	100.0	94.9	81.5	90.9
Rural Minor Arterial/Major Collector	83.5	84.1	96.1	88.1
Rural Minor Collector/Local	88.4	100.0	80.3	87.3
Urban Interstate/Freeway	95.5	97.0	79.7	96.5
Urban Principal Arterial	96.5	98.1	95.5	97.4
Urban Minor Arterial/Collector/Local	94.9	97.7	59.9	92.5
All	90.5	96.8	87.0	92.9

TABLE 6. TREND IN STATEWIDE USAGE RATES

PERCENT USING SAFETY BELTS			
YEAR	ALL FRONT SEAT OCCUPANTS	DRIVERS	CHILDREN UNDER FOUR YEARS OF AGE*
1982	**	4	15
1983	**	6	24
1984	**	7	30
1985	9	9	29
1986	13	13	30
1988	20	21	48
1989	25	26	49
1990	33	32	57
1991	39	39	57
1992	40	41	62
1993	42	42	61
1994	58	58	72
1995	54	54	66
1996	55	55	79
1997	54	54	82
1998	54	54	80
1999	59	59	89
2000	60	60	87
2001	62	62	89
2002	62	62	93

\*Children using either safety seat or safety belt. Children seated in front or rear seat.

\*\*Data not available.

**TABLE 7. USAGE RATE BY TYPE OF VEHICLE (ALL FRONT SEAT OCCUPANTS)**

FUNCTIONAL CLASSIFICATION	REGION			
	WEST	NORTH	EAST	ALL
Passengers Cars				
Rural Interstate	73.3	72.7	70.2	72.4
Rural Principal Arterial	70.9	80.7	60.5	67.5
Rural Minor Arterial/Major Collector	60.9	73.5	60.2	63.6
Rural Minor Collector/Local	57.5	66.0	58.0	59.3
Urban Interstate/Freeway	73.3	72.6	72.4	72.7
Urban Principal Arterial	63.6	63.3	62.6	63.3
Urban Minor Arterial/Collector/Local	64.9	65.7	58.3	64.6
All	65.9	70.1	61.4	67.0
Pickup Trucks				
Rural Interstate	52.1	53.0	53.6	52.9
Rural Principal Arterial	51.5	55.4	38.8	46.3
Rural Minor Arterial/Major Collector	38.9	48.9	36.4	40.4
Rural Minor Collector/Local	37.7	33.0	38.4	37.1
Urban Interstate/Freeway	50.2	50.9	56.5	51.0
Urban Principal Arterial	44.1	46.5	45.5	45.8
Urban Minor Arterial/Collector/Local	51.2	44.0	38.1	45.3
All	46.0	48.9	40.6	46.3
Vans				
Rural Interstate	83.6	75.5	70.4	76.5
Rural Principal Arterial	75.2	68.1	61.1	67.9
Rural Minor Arterial/Major Collector	58.7	70.1	61.4	62.3
Rural Minor Collector/Local	61.2	61.5	56.1	59.1
Urban Interstate/Freeway	70.0	72.5	76.8	72.3
Urban Principal Arterial	67.1	64.8	72.4	66.4
Urban Minor Arterial/Collector/Local	70.6	68.6	59.8	68.1
All	68.7	70.4	62.7	68.2
Sport Utility Vehicles				
Rural Interstate	80.5	73.9	76.2	75.9
Rural Principal Arterial	75.9	80.9	65.9	72.0
Rural Minor Arterial/Major Collector	64.3	70.1	62.0	64.9
Rural Minor Collector/Local	65.3	63.3	64.0	64.4
Urban Interstate/Freeway	72.6	71.8	75.9	72.0
Urban Principal Arterial	63.6	66.0	68.2	65.7
Urban Minor Arterial/Collector/Local	65.0	66.4	61.6	65.5
All	69.4	70.3	65.8	69.1

**APPENDIX A**

**COUNTY POPULATIONS AND NUMBER OF DATA COLLECTION SITES**

COUNTY	POPULATION*	NUMBER OF SITES	REGION**
Adair	17,244	1	3
Allen	17,800	0	1
Anderson	19,111	0	2
Ballard	8,286	0	1
Barren	38,033	8	1
Bath	11,085	0	3
Bell	30,060	2	3
Boone	85,991	9	2
Bourbon	19,360	0	2
Boyd	49,752	4	3
Boyle	27,697	2	2
Bracken	8,279	0	2
Breathitt	16,100	2	3
Breckinridge	18,648	1	1
Bullitt	61,236	3	2
Butler	13,010	0	1
Caldwell	13,060	0	1
Calloway	34,177	1	1
Campbell	88,616	5	2
Carlisle	5,351	0	1
Carroll	10,155	0	2
Carter	26,889	4	3
Casey	15,447	0	3
Christian	72,265	2	1
Clark	33,144	4	2
Clay	24,556	1	3
Clinton	9,634	0	3
Crittenden	9,384	0	1
Cumberland	7,147	0	3
Daviess	91,545	3	1
Edmonson	11,644	0	1
Elliott	6,748	0	3
Estill	15,307	0	3
Fayette	260,512	5	2
Fleming	13,792	0	3
Floyd	42,441	2	3
Franklin	47,687	2	2
Fulton	7,752	0	1
Gallatin	7,870	0	2
Garrard	14,792	0	2
Grant	22,384	1	2

COUNTY	POPULATION*	NUMBER OF SITES	REGION**
Graves	37,028	1	1
Grayson	24,053	4	1
Green	11,518	0	1
Greenup	36,891	4	3
Hancock	8,392	0	1
Hardin	94,174	7	1
Harlan	33,202	3	3
Harrison	17,983	0	2
Hart	17,445	0	1
Henderson	44,829	3	1
Henry	15,060	0	2
Hickman	5,262	0	1
Hopkins	46,519	3	1
Jackson	13,495	0	3
Jefferson	693,604	20	2
Jessamine	39,041	3	2
Johnson	23,445	3	3
Kenton	151,464	7	2
Knott	17,649	0	3
Knox	31,795	1	3
Larue	13,373	0	1
Laurel	52,715	6	3
Lawrence	15,569	0	3
Lee	7,916	0	3
Leslie	12,401	0	3
Letcher	25,277	4	3
Lewis	14,092	0	3
Lincoln	23,361	2	3
Livingston	9,804	0	1
Logan	26,573	4	1
Lyon	8,080	0	1
McCracken	65,514	9	1
McCreary	17,080	0	3
McLean	9,938	0	1
Madison	70,872	0	2
Magoffin	13,332	0	3
Marion	18,212	2	1
Marshall	30,125	5	1
Martin	12,578	1	3
Mason	16,800	0	3
Meade	26,349	2	1

COUNTY	POPULATION*	NUMBER OF SITES	REGION**
Menifee	6,556	0	3
Mercer	20,817	1	2
Metcalfe	10,037	0	1
Monroe	11,756	0	1
Montgomery	22,554	3	2
Morgan	13,948	0	3
Muhlenberg	31,839	3	1
Nelson	37,477	1	1
Nicholas	6,813	0	3
Ohio	22,916	0	1
Oldham	46,178	4	2
Owen	10,547	0	2
Owsley	4,858	0	3
Pendelton	14,390	0	2
Perry	29,390	2	3
Pike	68,736	2	3
Powell	13,237	0	3
Pulaski	56,217	2	3
Robertson	2,266	0	2
Rockcastle	16,582	1	3
Rowan	22,094	1	3
Russell	16,315	0	3
Scott	33,061	7	2
Shelby	33,337	3	2
Simpson	16,405	2	1
Spencer	11,766	0	2
Taylor	22,927	2	1
Todd	11,971	0	1
Trigg	12,597	0	1
Trimble	8,125	0	2
Union	15,637	0	1
Warren	92,522	3	1
Washington	10,916	0	1
Wayne	19,923	0	3
Webster	14,120	0	1
Whitley	35,865	4	3
Wolfe	7,065	0	3
Woodford	23,208	3	2
TOTALS	4,041,769	200	

\* Based on 2000 census.

\*\* Region 1 - West; Region 2 - North; Region 3 - East

**APPENDIX B**

**RELATIVE ERROR AND CONFIDENCE INTERVAL FOR  
USAGE FOR ALL FRONT SEAT PASSENGERS**

TABLE B-1. RELATIVE ERROR FOR DATA FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	RELATIVE ERROR*			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	3.6	3.1	4.4	1.4
Rural Principal Arterial	2.4	3.9	3.0	1.2
Rural Minor Arterial/Major Collector	4.5	3.5	5.6	1.6
Rural Minor Collector/Local	4.9	6.3	4.9	2.5
Urban Interstate/Freeway	2.6	1.4	5.4	1.0
Urban Principal Arterial	2.9	1.7	3.2	1.0
Urban Minor Arterial/Collector/Local	2.8	2.6	4.0	1.2
All	0.9	0.7	1.3	0.5

\* Percent (0.95 probability)

TABLE B-2. CONFIDENCE INTERVAL FOR DATA FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	CONFIDENCE INTERVAL*			
	REGION			
	WEST	NORTH	EAST	ALL
Rural Interstate	2.6	2.1	2.9	1.0
Rural Principal Arterial	1.6	2.8	1.6	0.7
Rural Minor Arterial/Major Collector	2.4	2.3	2.8	0.9
Rural Minor Collector/Local	2.5	3.6	2.6	1.3
Urban Interstate/Freeway	1.8	1.0	3.8	0.7
Urban Principal Arterial	1.8	1.1	1.9	0.6
Urban Minor Arterial/Collector/Local	1.8	1.6	2.1	0.7
All	0.5	0.4	0.7	0.3

\* Percentage with 0.95 probability.

**APPENDIX C**  
**SUMMARY OF DATA**

TABLE C-1. SUMMARY OF DATA

ALL FRONT SEAT OCCUPANTS					CATEGORY					
Location Number	Sample	Percent Usage	Relative Error*	Confidence Interval*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
1	299	78	6.1	4.7	210	79	89	75	4	100
2	223	78	7.1	5.5	152	77	71	79	0	N/A
3	130	77	9.4	7.2	83	76	47	79	0	N/A
4	360	63	7.9	5.0	301	63	59	63	6	67
5	553	78	4.4	3.4	360	77	193	80	9	100
6	447	71	5.9	4.2	376	73	71	61	1	100
7	249	71	7.8	5.6	173	75	76	64	1	100
8	394	75	5.7	4.3	268	76	126	73	6	67
9	397	77	5.4	4.1	334	79	63	68	0	N/A
10	818	50	6.8	3.4	645	52	173	46	7	100
11	1,311	75	3.1	2.3	1,084	75	227	74	14	93
12	915	60	5.3	3.2	691	60	224	60	0	N/A
13	293	76	6.4	4.9	256	77	37	73	2	100
14	404	66	6.9	4.6	316	67	88	65	2	100
15	266	75	7.0	5.2	189	74	77	77	3	100
16	494	63	6.7	4.3	368	64	126	61	3	100
17	530	62	6.7	4.1	408	60	122	66	6	100
18	750	69	4.8	3.3	661	68	89	71	0	N/A
19	823	57	5.9	3.4	629	58	194	54	2	100
20	512	67	6.1	4.1	419	66	93	71	0	N/A
21	911	47	6.9	3.2	673	46	238	48	13	85
22	300	44	12.7	5.6	227	45	73	42	12	100
23	681	51	7.3	3.8	496	52	185	50	14	93
24	156	71	10.1	7.2	105	71	51	69	2	50
25	212	54	12.5	6.7	159	54	53	53	1	0
26	519	51	8.5	4.3	384	53	135	44	3	100
27	1,317	50	5.5	2.7	958	48	359	52	18	89
28	428	54	8.8	4.7	319	53	109	54	1	100
29	1,409	49	5.3	2.6	1,041	50	368	48	43	79
30	345	52	10.0	5.3	251	53	94	51	5	100
31	484	49	9.2	4.5	349	48	135	50	8	62
32	216	56	11.7	6.6	175	59	41	46	0	N/A
33	665	43	8.8	3.8	506	43	159	42	3	67
34	72	44	25.8	11.5	53	49	19	32	0	N/A
35	346	64	7.9	5.1	280	62	66	70	1	100
36	323	51	10.6	5.4	248	51	75	53	3	67
37	721	52	7.0	3.6	557	53	164	51	0	N/A
38	531	53	7.9	4.2	403	53	128	56	1	100
39	65	42	28.8	12.0	46	30	19	68	0	N/A
40	78	35	30.5	10.6	60	37	18	28	1	100
41	438	72	5.8	4.2	332	72	106	75	0	N/A
42	627	78	4.1	3.2	526	77	101	82	3	100
43	314	69	7.4	5.1	231	69	83	69	1	100
44	755	65	5.2	3.4	612	66	143	63	13	92
45	702	63	5.7	3.6	546	62	156	65	0	N/A
46	376	77	5.5	4.2	282	74	94	85	2	100
47	1,430	66	3.7	2.4	1,123	65	307	70	3	100
48	705	60	6.0	3.6	549	60	156	59	9	100
49	931	52	6.1	3.2	788	55	143	38	7	100
50	1,735	56	4.2	2.3	1,376	57	359	53	17	100

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
Location Number	Sample	Percent Usage	Relative Error*	Confidence Interval*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
51	863	54	6.2	3.3	708	55	155	52	1	100
52	1,176	64	4.3	2.8	892	66	284	54	3	100
53	378	65	7.5	4.8	305	66	73	60	0	N/A
54	1,276	61	4.4	2.7	993	62	283	56	21	95
55	1,271	60	4.4	2.7	1,053	62	218	51	18	78
56	1,521	66	3.6	2.4	1,199	66	322	66	13	100
57	1,074	68	4.1	2.8	837	68	237	68	16	100
58	491	48	9.2	4.4	384	49	107	44	14	86
59	79	57	19.2	10.9	65	58	14	50	0	N/A
60	443	56	8.3	4.6	354	55	89	58	2	50
61	238	55	11.5	6.3	179	54	59	59	2	100
62	391	62	7.7	4.8	296	61	95	66	1	100
63	476	51	8.8	4.5	381	52	95	47	6	100
64	415	60	7.9	4.7	331	61	84	56	2	100
65	435	57	8.1	4.6	328	58	107	56	0	N/A
66	429	52	9.2	4.7	331	50	98	55	3	67
67	417	72	5.9	4.3	347	72	70	73	2	100
68	812	77	3.8	2.9	651	75	161	84	0	N/A
69	464	71	5.8	4.1	366	72	98	67	3	100
70	499	71	5.6	4.0	379	70	120	74	4	100
71	388	64	7.4	4.8	306	64	82	65	0	N/A
72	157	66	11.3	7.4	126	67	31	58	0	N/A
73	175	65	11.0	7.1	145	68	30	47	1	100
74	593	77	4.4	3.4	401	78	192	74	4	100
75	309	52	10.7	5.6	257	53	52	50	3	100
76	326	63	8.2	5.2	268	63	58	67	0	N/A
77	198	72	8.7	6.3	154	71	44	75	2	100
78	186	77	7.8	6.0	145	75	41	85	0	N/A
79	971	64	4.8	3.0	789	63	182	68	13	100
80	961	77	3.5	2.7	816	77	145	77	12	100
81	949	65	4.7	3.0	793	66	156	61	6	67
82	294	70	7.4	5.2	230	71	64	69	0	N/A
83	857	61	5.4	3.3	652	62	205	58	3	100
84	792	58	5.9	3.4	620	57	172	63	13	92
85	77	66	15.9	10.6	50	64	27	70	1	100
86	273	71	7.6	5.4	221	73	52	62	2	100
87	293	54	10.5	5.7	221	52	72	60	2	100
88	615	72	4.9	3.6	503	73	112	66	9	100
89	124	60	14.2	8.6	111	61	13	54	0	N/A
90	252	56	11.0	6.1	194	56	58	55	9	89
91	202	53	12.9	6.9	156	54	46	50	1	100
92	583	61	6.4	4.0	465	61	118	64	2	0
93	321	56	9.7	5.4	262	53	59	68	5	80
94	762	68	4.9	3.3	627	68	135	67	1	100
95	95	40	24.6	9.8	68	46	27	26	0	N/A
96	19	37	58.9	21.7	14	43	5	20	0	N/A
97	78	53	21.1	11.1	59	49	19	63	2	100
98	242	53	11.8	6.3	187	55	55	47	2	100
99	169	59	12.7	7.4	119	58	50	60	1	100
100	411	66	7.0	4.6	299	66	112	64	4	100

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
Location Number	Sample	Percent Usage	Relative Error*	Confidence Interval*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
101	215	52	12.8	6.7	163	55	52	42	0	N/A
102	845	64	5.0	3.2	678	64	167	66	12	92
103	699	68	5.1	3.5	502	70	197	63	3	67
104	509	74	5.1	3.8	375	72	134	81	0	N/A
105	480	64	6.7	4.3	403	64	77	69	0	N/A
106	1,385	75	3.0	2.3	1,064	76	321	72	16	88
107	696	75	4.3	3.2	557	74	139	79	1	100
108	591	73	4.8	3.6	448	73	143	75	6	100
109	1,036	73	3.7	2.7	804	73	232	73	14	100
110	1,550	70	3.2	2.3	1,261	72	289	66	29	90
111	763	69	4.8	3.3	588	69	175	70	3	100
112	549	68	5.8	3.9	450	69	99	64	7	86
113	579	75	4.7	3.5	476	74	103	79	1	100
114	879	71	4.2	3.0	704	73	175	66	17	94
115	678	71	4.9	3.4	560	70	118	71	0	N/A
116	808	70	4.5	3.2	670	73	138	55	32	100
117	685	60	6.1	3.7	532	61	153	58	3	100
118	547	58	7.1	4.1	447	58	100	59	5	100
119	333	70	7.0	4.9	266	71	67	69	0	N/A
120	951	55	5.7	3.2	782	56	169	49	8	100
121	1,316	61	4.3	2.6	1,052	59	264	67	8	88
122	767	60	5.7	3.5	620	60	147	61	4	100
123	527	63	6.6	4.1	446	63	81	59	2	100
124	1,192	55	5.2	2.8	949	57	243	47	18	83
125	756	62	5.5	3.5	615	63	141	60	3	100
126	1,312	74	3.2	2.4	1,106	75	206	69	25	100
127	650	42	8.9	3.8	526	42	124	44	5	100
128	375	54	9.3	5.0	256	54	119	55	6	100
129	899	69	4.4	3.0	733	70	166	65	3	100
130	1,018	55	5.6	3.1	794	55	224	55	1	100
131	910	59	5.4	3.2	647	57	263	65	0	N/A
132	802	61	5.5	3.4	686	60	116	66	1	100
133	791	46	7.6	3.5	638	47	153	39	6	100
134	551	46	9.0	4.2	451	47	100	42	2	100
135	757	64	5.3	3.4	636	64	121	67	1	100
136	456	51	8.9	4.6	362	52	94	50	0	N/A
137	1,002	67	4.4	2.9	861	69	141	53	6	100
138	436	65	6.8	4.5	344	65	92	66	3	100
139	409	50	9.8	4.8	346	50	63	46	3	100
140	581	58	6.9	4.0	454	58	127	57	11	100
141	1,603	59	4.1	2.4	1,310	59	293	56	21	90
142	434	50	9.5	4.7	350	52	84	39	0	N/A
143	556	65	6.0	4.0	473	67	83	57	7	100
144	1,136	60	4.7	2.8	946	59	190	65	24	83
145	502	57	7.5	4.3	433	55	69	72	3	100
146	562	56	7.4	4.1	469	55	93	61	2	100
147	537	63	6.5	4.1	458	63	79	61	2	100
148	1,267	48	5.8	2.7	983	48	284	46	10	100
149	396	65	7.2	4.7	294	66	102	64	1	100
150	582	70	5.3	3.7	409	73	173	65	9	89

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
Location Number	Sample	Percent Usage	Relative Error*	Confidence Interval*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
151	237	68	8.8	6.0	185	69	52	62	7	100
152	615	71	5.0	3.6	435	69	180	76	7	100
153	326	67	7.6	5.1	256	63	70	83	0	N/A
154	334	73	6.6	4.8	245	73	89	72	1	100
155	528	56	7.5	4.2	403	59	125	48	4	75
156	940	59	5.3	3.1	747	60	193	55	5	80
157	406	53	9.1	4.9	292	55	114	47	1	100
158	446	62	7.3	4.5	314	63	132	59	1	100
159	227	46	14.1	6.5	174	44	53	51	1	100
160	570	49	8.4	4.1	434	50	136	46	12	92
161	790	57	6.0	3.5	638	56	152	60	6	83
162	596	54	7.4	4.0	439	55	157	54	5	80
163	543	48	8.8	4.2	422	49	121	45	1	0
164	1,057	53	5.7	3.0	841	53	216	52	10	90
165	360	54	9.5	5.1	286	53	74	59	0	N/A
166	912	56	5.7	3.2	743	58	169	51	8	88
167	216	43	15.3	6.6	158	44	58	40	6	67
168	296	54	10.5	5.7	225	54	71	55	5	100
169	204	51	13.3	6.9	160	54	44	43	0	N/A
170	288	55	10.4	5.7	223	52	65	65	4	100
171	120	48	18.5	8.9	79	44	41	56	0	N/A
172	100	48	20.4	9.8	71	52	29	38	0	N/A
173	135	58	14.4	8.3	99	57	36	61	2	100
174	917	45	7.2	3.2	746	45	171	43	7	100
175	150	41	19.3	7.9	114	40	36	42	4	50
176	217	50	13.4	6.7	160	50	57	49	2	100
177	344	48	11.0	5.3	254	50	90	41	11	73
178	100	46	21.2	9.8	60	47	40	45	0	N/A
179	104	55	17.4	9.6	76	53	28	61	0	N/A
180	382	46	10.9	5.0	302	45	80	49	4	100
181	50	44	31.3	13.8	32	44	18	44	0	N/A
182	145	48	17.1	8.1	112	49	33	42	1	100
183	68	56	21.1	11.8	49	57	19	53	1	100
184	40	25	53.7	13.4	32	22	8	38	0	N/A
185	273	39	14.8	5.8	209	38	64	42	3	67
186	833	59	5.6	3.3	634	62	199	53	3	67
187	510	70	5.7	4.0	417	72	93	62	5	80
188	440	69	6.2	4.3	313	70	127	67	8	75
189	1,056	58	5.1	3.0	813	60	243	52	5	100
190	943	65	4.7	3.0	723	66	220	61	7	100
191	1,002	63	4.7	3.0	732	64	270	61	0	N/A
192	1,058	67	4.3	2.8	786	67	272	67	8	100
193	1,169	61	4.5	2.8	980	62	189	61	12	92
194	961	58	5.3	3.1	776	59	185	55	10	80
195	974	50	6.3	3.1	732	52	242	44	23	74
196	511	55	7.9	4.3	390	56	121	50	10	90
197	941	56	5.7	3.2	766	58	175	46	2	100
198	545	54	7.8	4.2	402	54	143	54	14	79
199	819	53	6.4	3.4	600	55	219	49	5	40
200	837	60	5.6	3.3	633	60	204	58	7	100

\* Percent (using 0.95 probability)